

**FCC CERTIFICATION**  
**On Behalf of**  
**Eastern Times Technology Co., Ltd.**

**Wireless Optical Mouse**  
**Model No.: DS-2135(2135-L+2121-L)**

**FCC ID: TUV2135L**

Prepared for : Eastern Times Technology Co., Ltd.  
Address : Building 5, Penghua Industry Park, Heping Rd.(W),  
Longhua, Shenzhen, Guangdong, China

Prepared by : ACCURATE TECHNOLOGY CO. LTD  
Address : F1, Bldg. A, Changyuan New Material Port, Keyuan Rd.  
Science & Industry Park, Nanshan, Shenzhen, Guangdong  
P.R. China

Tel: (0755) 26503290  
Fax: (0755) 26503396

Report Number : ATE20080335  
Date of Test : March 05, 2008  
Date of Report : March 07, 2008

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## Test Report Certification

Applicant : Eastern Times Technology Co., Ltd.  
Manufacturer : Eastern Times Technology Co., Ltd.  
EUT Description : Wireless Optical Mouse  
(A) MODEL NO.: DS-2135(2135-L+2121-L)  
(B) SERIAL NO.: N/A  
(C) POWER SUPPLY: 2.4V DC ("AAA" batteries 2×)

Measurement Procedure Used:

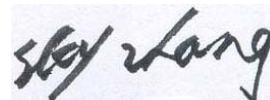
FCC Rules and Regulations Part 15 Subpart C Section 15.227: 2007 & ANSI C63.4:2003

The device described above is tested by ACCURATE TECHNOLOGY CO. LTD to determine the maximum emission levels emanating from the device. The maximum emission levels are compared to the FCC Part 15 Subpart C Section 15.227 limits. The measurement results are contained in this test report and ACCURATE TECHNOLOGY CO. LTD is assumed full responsibility for the accuracy and completeness of these measurements. Also, this report shows that the Equipment Under Test (EUT) is to be technically compliant with the FCC requirements.

This report applies to above tested sample only. This report shall not be reproduced in part without written approval of ACCURATE TECHNOLOGY CO. LTD.

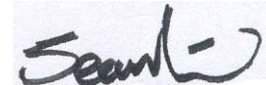
Date of Test : March 05, 2008

Prepared by :



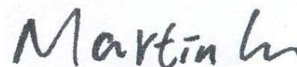
(Engineer)

Reviewer :



(Quality Manager)

Approved & Authorized Signer :



(Manager)

# 1. GENERAL INFORMATION

## 1.1. Description of Device (EUT)

EUT : Wireless Optical Mouse

Model Number : DS-2135(2135-L+2121-L)

Power Supply : 2.4V DC (“AAA” batteries 2×)

Applicant : Eastern Times Technology Co., Ltd.  
Address : Building 5, Penghua Industry Park, Heping Rd.(W),  
Longhua, Shenzhen, Guangdong, China

Manufacturer : Eastern Times Technology Co., Ltd.  
Address : Building 5, Penghua Industry Park, Heping Rd.(W),  
Longhua, Shenzhen, Guangdong, China

Date of sample received : March 04, 2008  
Date of Test : March 05, 2008

## 1.2. Description of Test Facility

EMC Lab : Listed by FCC  
The Registration Number is 274801

Listed by Industry Canada  
The Registration Number is IC4174

Accredited by China National Accreditation Committee  
for Laboratories  
The Certificate Registration Number is L0579

Name of Firm : Shenzhen Academy of Metrology& Quality Inspection  
Site Location : Bldg. Metrology& Quality Inspection, Longzhu Road,  
Nanshan, Shenzhen, Guangdong, P.R. China

## 1.3. Measurement Uncertainty

Conducted emission expanded uncertainty = 3.5dB, k=2

Radiated emission expanded uncertainty = 4.5dB, k=2

## 2. MEASURING DEVICE AND TEST EQUIPMENT

**Table 1: List of Test and Measurement Equipment**

Kind of equipment	Manufacturer	Type	S/N	Calibrated until
EMI Test Receiver	Rohde&Schwarz	ESCS30	100307	03.31.2008
EMI Test Receiver	Rohde&Schwarz	ESI26	838786/013	01.23.2009
Loop Antenna	Schwarzbeck	FMZB1516	113	01.23.2009
Bilog Antenna	Schwarzbeck	VULB9163	9163-194	03.31.2008
Bilog Antenna	Chase	CBL6112B	2591	01.23.2009
Horn Antenna	Rohde&Schwarz	HF906	100013	01.23.2009
Spectrum Analyzer	Anritsu	MS2651B	6200238856	03.31.2008
Pre-Amplifier	Agilent	8447D	2944A10619	03.31.2008

### 3. SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
Section 15.207	Conducted Emission	N/A
Section 15.209 Section 15.227(b)	Radiated Emission	Compliant
Section 15.227(a)	Fundamental Radiated Emission	Compliant
Section 15.227	Band Edge	Compliant

4. RADIATED EMISSION FOR FCC PART 15 SECTION 15.227(B)

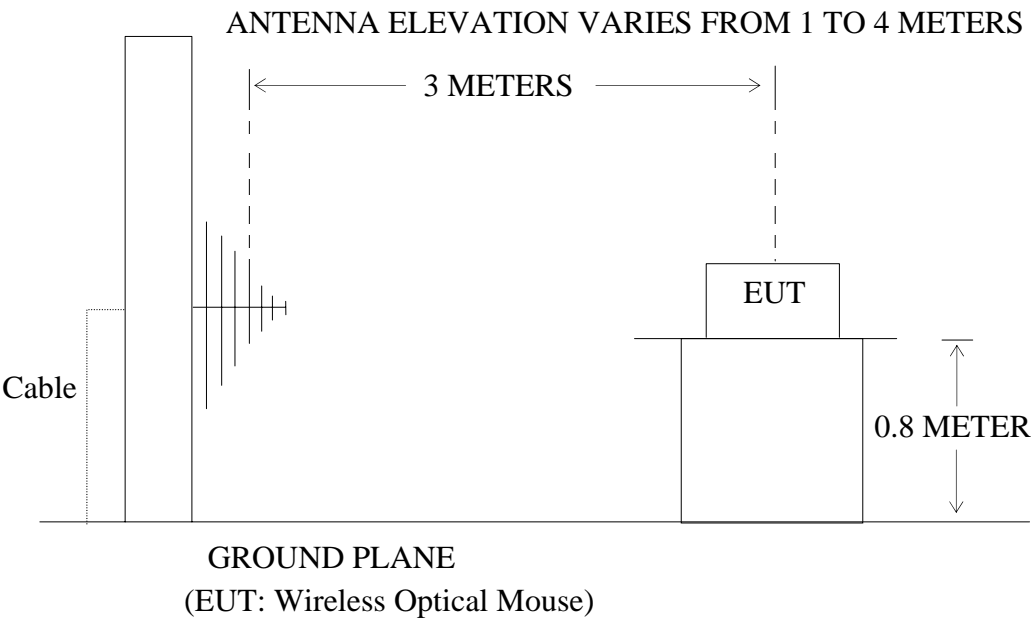
4.1. Block Diagram of Test Setup

4.1.1. Block diagram of connection between the EUT and simulators



(EUT: Wireless Optical Mouse)

4.1.2. Anechoic Chamber Test Setup Diagram



4.2. The Field Strength of Radiation Emission Measurement Limits

4.2.1. The field strength of any emissions which appear outside of this band shall not exceed the general radiated emission limits in section 15.209

Radiation Emission Measurement Limits According to Section 15.209(a)

Frequency (MHz)	Limit,		The final measurement in band 9-90kHz, 110-490kHz and above 1000MHz is performed with Average detector. Except those
	Field Strength of Quasi-peak Value (microvolts/m)	Field Strength of Quasi-peak Value (dBμV/m)	
30 - 88	100	40	
88 - 216	150	43.5	

216 - 960	200	46	frequency bands mention above, the final measurement for frequencies below 1000MHz is performed with Quasi Peak detector.
Above 960	500	54	

### 4.3.Configuration of EUT on Measurement

The following equipment are installed on Radiated Emission Measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

#### 4.3.1. Wireless Optical Mouse (EUT)

Model Number : DS-2135(2135-L+2121-L)  
 Serial Number : N/A  
 Manufacturer : Eastern Times Technology Co., Ltd.

### 4.4.Operating Condition of EUT

4.4.1.Setup the EUT and simulator as shown as Section 4.1.

4.4.2.Turn on the power of all equipment.

4.4.3. Let the EUT work in TX modes and measure it.

### 4.5.Test Procedure

The EUT and its simulators are placed on a turntable, which is 0.8 meter high above ground. The turntable can rotate 360 degrees to determine the position of the maximum emission level. EUT is set 3.0 meters away from the receiving antenna, which is mounted on an antenna tower. The antenna can be moved up and down between 1.0 meter and 4 meters to find out the maximum emission level. Broadband antenna (calibrated bilog antenna) is used as receiving antenna. Both horizontal and vertical polarizations of the antenna are set on measurement. In order to find the maximum emission levels, all of the interface cables must be manipulated according to ANSI C 63.4: 2003 on radiated emission measurement.

The bandwidth of test receiver (R&S ESCS30) is set at 120KHz in 30-1000MHz. The frequency range from 30MHz to 1000MHz is checked.

The final measurement in band 9-90kHz, 110-490kHz and above 1000MHz is performed with Average detector. Except those frequency bands mention above, the final measurement for frequencies below 1000MHz is performed with Quasi Peak detector.



#### 4.6. The Field Strength of Radiation Emission Measurement Results

##### **PASS.**

The frequency range 30MHz to 1000MHz is investigated.

Date of Test:	March 05, 2008	Temperature:	25°C
EUT:	Wireless Optical Mouse	Humidity:	46%
			2.4V DC (“AAA” battery)
Model No.:	DS-2135(2135-L+2121-L)	Power Supply:	2×)
Test Mode:	TX	Test Engineer:	Feng

Polarization	Frequency (MHz)	Reading(dBμV/m) QP	Factor Corr.( dB)	Result(dBμV/m) QP	Limits(dBμV/m) QP	Margin(dBμV/m) QP
Horizontal	81.132	12.0	8.8	20.8	40.0	19.2
Horizontal	108.178	7.3	7.0	14.3	43.5	29.2
Horizontal	135.216	13.8	5.6	19.4	43.5	24.1
Horizontal	162.264	11.8	6.8	18.6	43.5	24.9
Horizontal	189.310	10.1	8.9	19.0	43.5	24.5
Horizontal	216.352	11.3	9.7	21.0	46.0	25.0
Horizontal	243.392	13.4	9.8	23.2	46.0	22.8
Vertical	81.132	12.3	5.6	17.9	40.0	22.1
Vertical	135.226	11.3	7.3	18.6	43.5	24.9
Vertical	189.820	9.2	8.9	18.1	43.5	25.4
Vertical	270.140	11.3	10.4	21.7	46.0	24.3

Note:

1. The spectral diagrams in appendix 1 display the measurement of peak values with corrected factors counted.
2. The field strength is calculated by adding the antenna factor, high pass filter loss(if used) and cable loss, and subtracting the amplifier gain(if any)from the measured reading. The basic equation calculation is as follows:

$$\text{Result} = \text{Reading} + \text{Corrected Factor}$$

Where Corrected Factor = Antenna Factor + Cable Loss + High Pass Filter Loss – Amplifier Gain

## 5. FUNDAMENTAL RADIATED EMISSION FOR FCC PART 15

### SECTION 15.227(A)

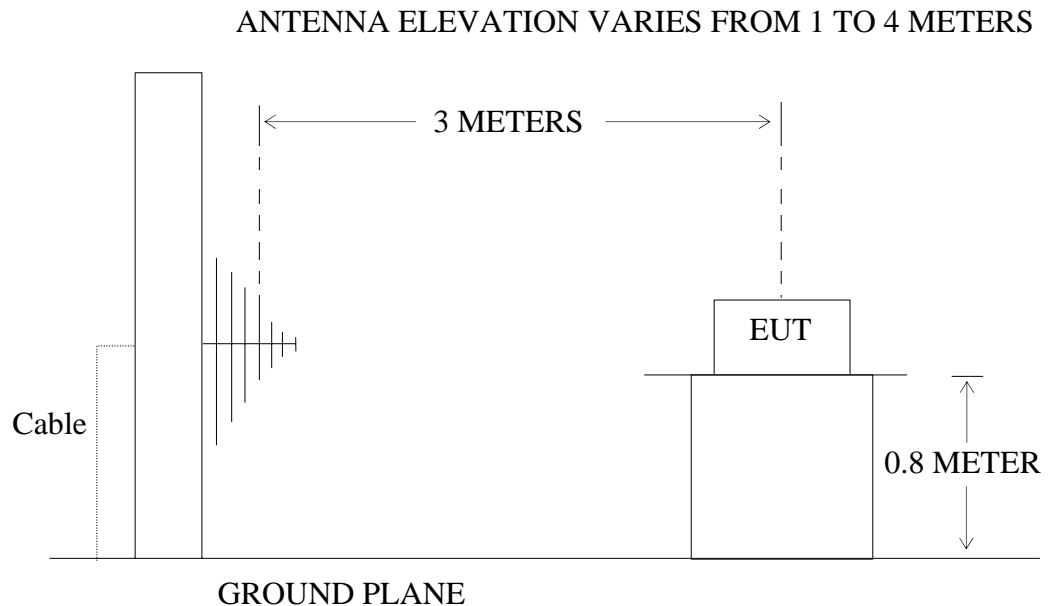
#### 5.1. Block Diagram of Test Setup

##### 5.1.1. Block diagram of connection between the EUT and simulators



(EUT: Wireless Optical Mouse)

##### 5.1.2. Anechoic Chamber Test Setup Diagram



(EUT: Wireless Optical Mouse)

#### 5.2. The Emission Limit For Section 15.227(a)

5.2.1 The field strength of any emission within this band shall not exceed 10,000 microvolts/meter at 3 meters. The emission limit in this paragraph is based on measurement instrumentation employing an average detector. The provisions in Section 15.35 for limiting peak emission apply.

### 5.3.EUT Configuration on Measurement

The following equipment are installed on the emission Measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

#### 5.3.1. Wireless Optical Mouse (EUT)

Model Number : DS-2135(2135-L+2121-L)  
Serial Number : N/A  
Manufacturer : Eastern Times Technology Co., Ltd.

### 5.4.Operating Condition of EUT

5.4.1.Setup the EUT and simulator as shown as Section 4.1.

5.4.2.Turn on the power of all equipment.

5.4.3.Let the EUT work in TX mode and measure it.

### 5.5.Test Procedure

The EUT and its simulators are placed on a turntable, which is 0.8 meter high above ground. The turntable can rotate 360 degrees to determine the position of the maximum emission level. EUT is set 3.0 meters away from the receiving antenna, which is mounted on an antenna tower. calibrated Loop antenna is used as receiving antenna. In order to find the maximum emission levels, all of the interface cables must be manipulated according to ANSI C 63.4: 2003 on radiated emission measurement.

The bandwidth of test receiver (R&S ESCS30) is set at 9KHz in 9kHz-30MHz

## 5.6.The Emission Measurement Result

**PASS.**

Date of Test:	March 05, 2008	Temperature:	25°C
EUT:	Wireless Optical Mouse	Humidity:	46%
			2.4V DC (“AAA” battery
Model No.:	DS-2135(2135-L+2121-L)	Power Supply:	2×)
Test Mode:	TX	Test Engineer:	Feng

### Fundamental Radiated Emissions

Test conditions		Fundamental Frequency	
		27.045MHz	
T <sub>nom</sub> (25°C)	Unit	(dBμV/m)/(μV/m) PEAK	(dBμV/m)/(μV/m) AV
		46.6/218	43.8/155
limit		100/100,000	80/10,000
Note: Measurement was performed with modulated signal with average detector and peak detector.			

## 6. BAND EDGES

### 6.1.The Requirement

6.1.1. The wanted emission within the band 26.96-27.28MHz.

### 6.2.EUT Configuration on Measurement

The following equipment are installed on the emission Measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

#### 6.2.1.Wireless Optical Mouse (EUT)

Model Number : DS-2135(2135-L+2121-L)  
Serial Number : N/A  
Manufacturer : Eastern Times Technology Co., Ltd.

### 6.3.Operating Condition of EUT

6.3.1.Setup the EUT and simulator as shown as Section 5.1.

6.3.2.Turn on the power of all equipment.

6.3.3.Let the EUT work in TX mode and measure it.

### 6.4.Test Procedure

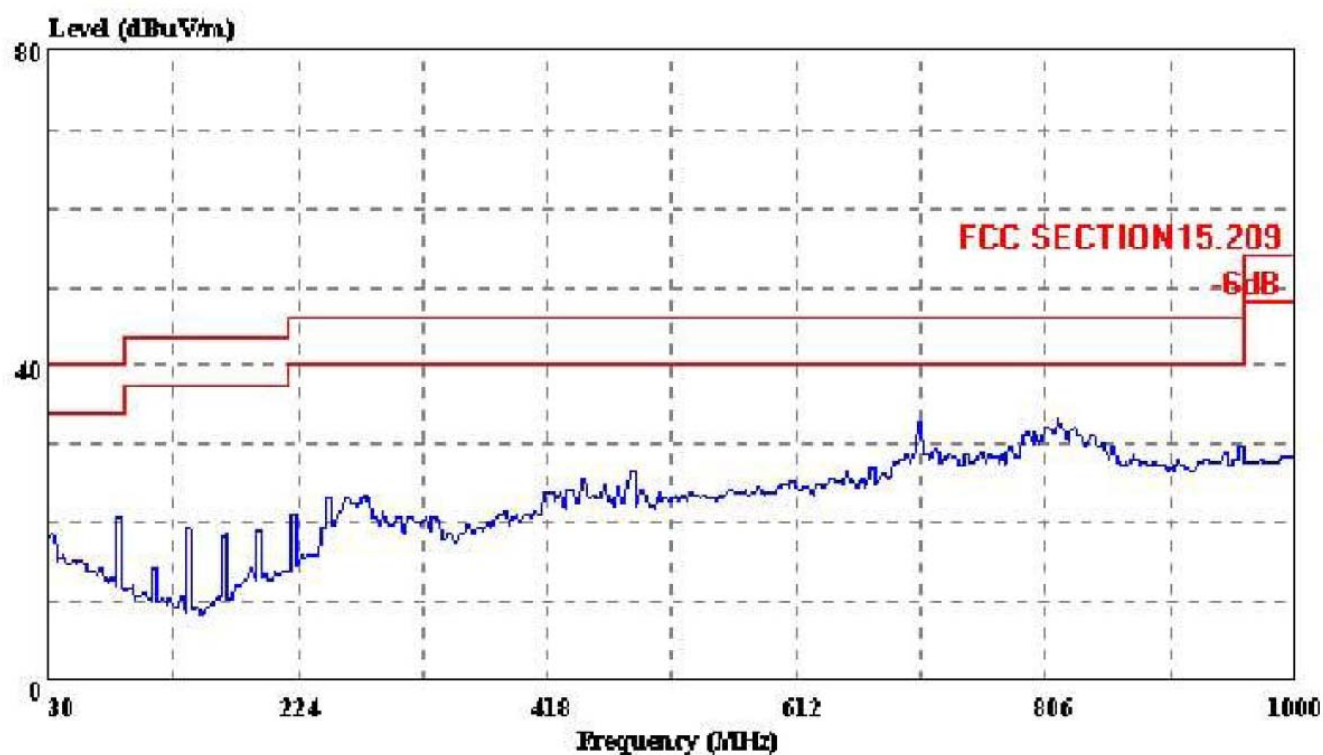
The transmitter output was fed into the spectrum analyzer and photo was taken. The vertical scale is set to 10dB per division; the horizontal scale is set to 32kHz per division. Star frequency are 26.96MHz, stop frequency are 27.28MHz .  
RBW are 3kHz, VBW are 10kHz, Sweep time are 50ms.

## 6.5.The Measurement Result

**The EUT does meet the requirement.**

The spectral diagrams in appendix 1.

# APPENDIX I (Test Curves)

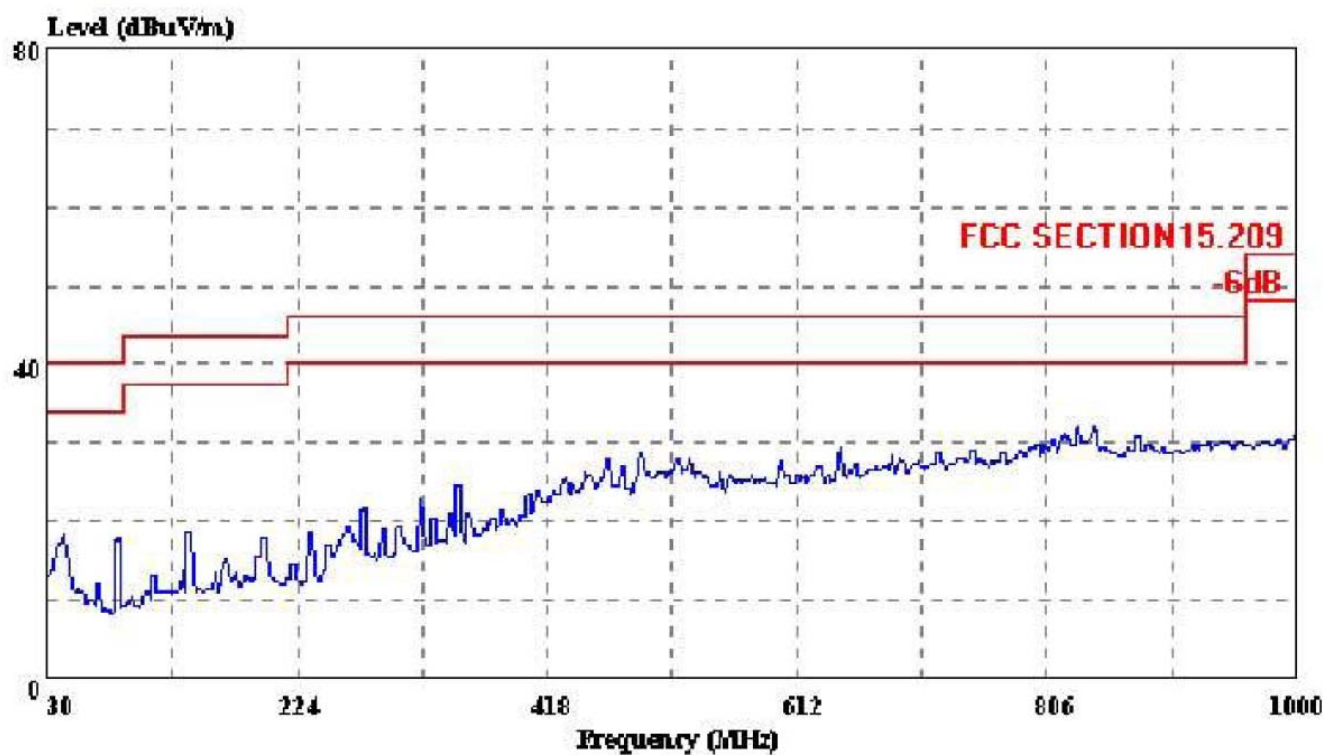


Trace:

Ref Trace:

Condition: FCC SECTION15.209 3m ATC FCC15C ANTENNA HORIZONTAL  
 eut : Wireless Optical Mouse  
 : M/N: DS-2135 (2135-L+2121-L)  
 power : DC 2.4V  
 memo : TX  
 manuf : Eastern Times  
 sample No.: 080547  
 report No.: ATE20080335





Trace:

Ref Trace:

Condition: FCC SECTION 15.209 3m ATC FCC15C ANTENNA VERTICAL

eut : Wireless Optical Mouse

: M/N: DS-2135 (2135-L+2121-L)

power : DC 2.4V

memo : TX

manuf : Eastern Times

sample No.: 080547

report No.: ATE20080335



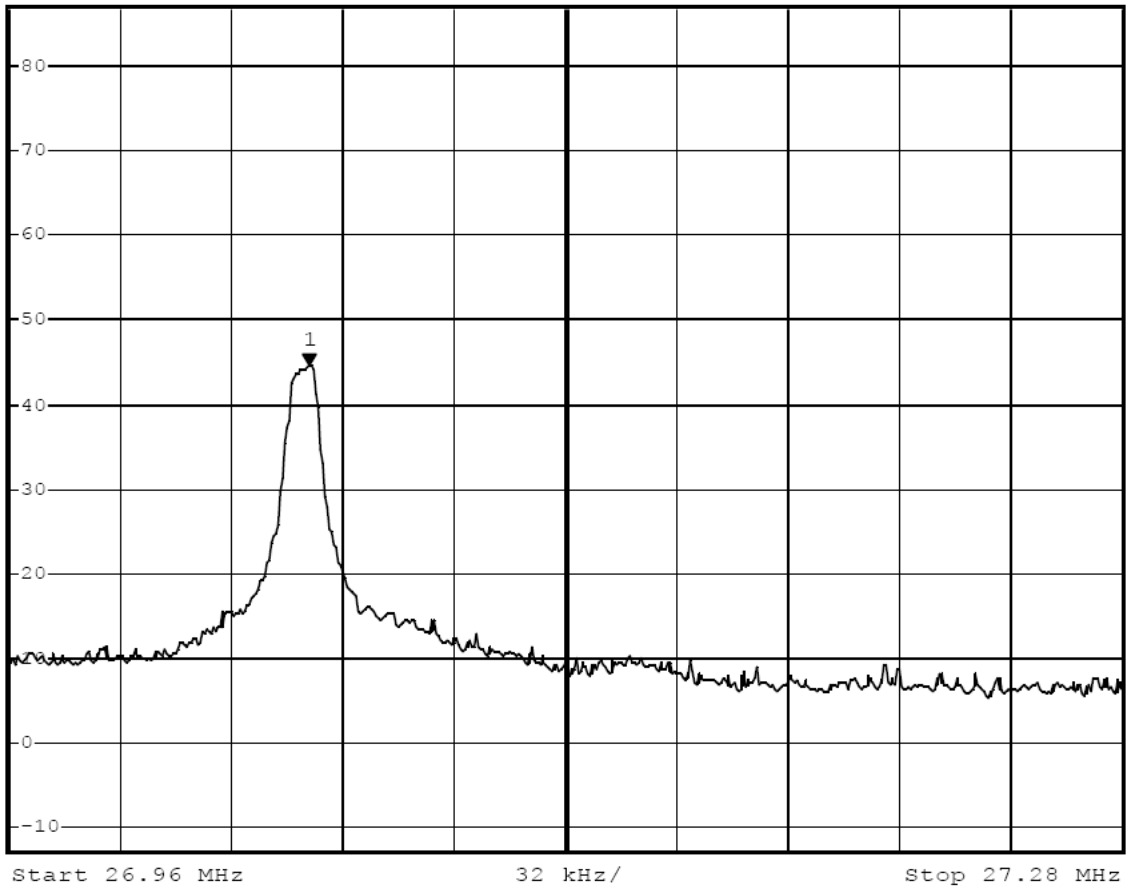
\*RBW 3 kHz      Marker 1 [T1 ]  
\*VBW 10 kHz      45.23 dBμV  
\*SWT 50 ms      27.046400000 MHz

Ref 87 dBμV

Att 10 dB

UNCAL

1 PR  
VIEW



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PRN